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Procedia - Social and Behavioral Sciences 234 (2016) 498 – 505

Procedia
Social and Behavioral Sciences

ASEAN-Turkey ASLI (Annual Serial Landmark International) Conferences on Quality of Life 2016
AMER International Conference on Quality of Life, AicQoL2016Medan
25 – 27 February 2016, Medan, Indonesia

Characteristics of and Quality of Life in a Transit Oriented Development (TOD) of Bandar Sri Permaisuri, Kuala Lumpur

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Abstract

Transit Oriented Development (TOD) is a relatively new strategy to arrest the phenomenon of urban sprawl. It entails development centers around a transit station with mixed use and high-density development. This paper evaluates the TOD in Bandar Sri Permaisuri, Kuala Lumpur through descriptive and comparative analyses and survey of residents. It found that Sri Permasuri TOD has met main physical characteristics of TODs especially related to land use mix and density. The survey found that most respondents are comfortable with the mixed use and high density of Sri Permaisuri TOD but unhappy with pollution, congestions and lack of covered walkway in the township.

Peer-review under responsibility of the Association of Malaysian Environment-Behavior Researchers, AMER (ABRA malaysia)

Keywords: Transit oriented development; quality of life; Bandar Sri Permaisuri; mixed land use

1. Introduction

Transit Oriented Development (TOD) is a relatively new urban development concept implemented in Kuala Lumpur Malaysia. It is a compact, mixed-use development around a transit station to encourage the public to use public transport and reduce reliance on private vehicles. The main example of TOD in Kuala Lumpur is the Kuala

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Peer-review under responsibility of the Association of Malaysian Environment-Behavior Researchers, AMER (ABRA malaysia)
doi:10.1016/j.sbspro.2016.10.268

Lumpur Sentral whereby major train lines which serve the city, surrounding urban areas and the whole Peninsular Malaysia converge.

TOD is supposed to bring about new compact development in urban areas to address the worsening situation of urban sprawl in cities throughout the world. By providing essential urban services such as residential, commercial, institutional and recreational within short distance of one another, it is designed to reduce commuting and provide efficiency in urban development. Mixed land use and density are two main factors considered in any TOD development.

A better quality of life is another objective of a TOD. A higher density may cause overcrowding and negatively affect the quality of life while mixed land use development may provide conveniences to residents and improve their quality of life. Thus, there may be a tradeoff between physical efficiency and quality of life.

This paper evaluates the implementation of the TOD at Bandar Sri Permaisuri, Kuala Lumpur, a new urban development project which started almost 20 years ago. Its main aim is to analyze the physical development characteristics of the TOD and its performance in achieving stated development objectives. Its objectives include measuring the physical characteristics of TOD in Bandar Sri Permaisuri against established principles of TOD and evaluating the quality of life of residents who live in the neighborhood.

2. Literature review

Urban sprawl is one of the most pressing issues confronting cities throughout the world. Sprawl is defined as urban development whereby the growth of the built up area is much higher compared to the population growth. It is a situation whereby people live and work farther from the city center and longer distances due to their dependency on the automobiles (Kahn, 2000). Causes of sprawl include changes in population growth and the household income, rise in the housing prices in city the center, subsidization on infrastructure investments especially roads, ineffective land use policies and reliance on private automobiles (Glaeser and Kahn 2004).

In Malaysia, problems of urban sprawl exacerbated during the economic and urban development boom of the late 1980s until late 1990s. It was found that average annual population growth in the district surrounding Kuala Lumpur was more than eight times that of the city itself. Consequently, the share of Kuala Lumpur Metropolitan Region attributed to Kuala Lumpur had shrunken from 48 percent in 1970 to only 22 percent in 2010 (Jamalunlaili Abdullah, 2003 and 2012). This phenomenon of urban sprawl leads to various urban development issues such as inefficient use of land, loss of agriculture land, negative impacts on water catchment areas, traffic congestion, and heavy reliance on private automobiles.

In order to reduce the phenomenon of urban sprawl, the concept of TOD which is part of the Sustainable Urban Development movement was introduced in early 1990s. TOD is considered as one of the most effective way of reducing urban sprawl and bringing people back to the city centers. It is an urban development strategy whereby intensive urban development is encouraged around a public transit station in order to compel people to live and work near the transit station.

The main elements of TOD are diversity, density and design. Diversity is in the form of mixed use development, density in the form of more residence and jobs while design in the form of good street connectivity for pedestrian (Carvero and Kockelman, 1997). The common nucleus is the transit station in the neighborhood.

Transportation and land use affect each other. It was found that higher degree of land use mix and greater population density tend to reduce per capita vehicle travel and increase use of alternative transportation mode, particularly for errands. Improved walking and cycling conditions also decreases automobile travel and encourage people to use mass rapid transit (Litman 2010). Thus, a good TOD that meets established principles of TOD would ensure that the objectives of that development are achieved and the residents' quality of life are improved.

There are a few characteristics of a TOD which are listed below:

- Grid street pattern
- Higher population densities
- Limited surface parking and efficient parking management
- Pedestrian- and bicycle-oriented design
- Mixed-housing types, including multi-family

- Horizontal (side by side) and vertical (within the same building) mixed use
- Office and retail, particularly on main streets. (Source: Renne, 2009)

Calthorpe (1993) classified TODs into two types, urban TODs with high commercial and residential densities consisting of offices, large scale shopping centers and located at main transit stations and neighborhood TOD, which consists of single family houses and apartments as well as neighborhood shopping area. KL Sentral is a good example of an urban TOD while Bandar Sri Permasiuri is classified as a neighborhood TOD.

In addition to major elements of a TOD such as mixed land use, high density development, common public space and pedestrian friendly design, Calthorpe also proposed range of acceptable standards for neighborhood TODs. Specifically residential development (houses, apartment and villas) constitutes 50 to 80 percent of land use, core and employment category (commercial and institutional) constitute 30 to 70 percent of land use while public areas and facilities constitute 5 t0 15 percent of the land use. This study evaluates whether Bandar Sri Permaisuri meets these land use ranges.

In addition to characteristics of a TOD, this paper also evaluates the quality of life of residents in Bandar Sri Permaisuri TOD. This is due to the fact that while the locations being near a transit station and mixture of land use provide convenience to residents, a higher density development may result in overcrowding and uncomfortable living environment to the residents. It should be noted that better quality of life is one of the paramount objectives of TODs.

Quality of life encompasses a multi-dimensional sense of well-being which can be categorized into five main domains: physical, material, social, emotional and developmental activity (Felce and Perry 1995 cited by Harifah, Naasah and Foo, 2014). In a study of the bus system in Kota Kinabalu, Harifah, Nassah and Foo found that efficient and comfortable bus transportation system contributes to a better quality of life for Kota Kinabalu residents. This finding is relevant to this study as well since the light rail transit (LRT) system in Bandar Sri Permaisri is a very integral component of life in Bandar Sri Permaisuri because its existence is one of the major reasons of Bandar Sri Permaisuri development and the residents' decision to stay in the area.

3. Study area

Bandar Sri Permaisuri is a rather new township opened in year the 2000 in Cheras area of Kuala Lumpur. It is about 12 kilometres from Kuala Lumpur City Center. It is well connected to the RapidKL LRT system via Salak Selatan LRT station, Salak Selatan KTM commuter station as well as the Sungei Besi Expressway and East West Link Highway. It is developed as an integrated, self-contained residential, commercial and recreational township on a 220 acres site. While most residential and institutional developments have been completed, shopping mall and service apartment development have commenced construction recently. In addition, there is a 40 acre public park (Taman Tasik Permaisuri) which is located adjacent to Bandar Sri Permaisuri. In addition there are two sizeable man-made lakes totaling 60 acres adjacent to the neighborhood.

4. Methodology

The main methodologies of this study are descriptive and comparative analyses of physical development in Bandar Sri Permaisuri development. Specifically, it evaluates characteristics of Bandar Sri Permaisuri and evaluates them against the characteristics of good TODs set by Calthorpe (1993). The purpose of this analysis is to determine which physical components of Bandar Sri Permaisuri meet the established standards and which ones are lacking.

For the quality of life analysis, a survey of 150 respondents who live in the area was also conducted to determine perception of quality of life of residents in this TOD neighborhood. It is based on a 95 confidence level with 8 percent margin of error and 30,000 population base. It used multistage sampling whereby certain percentage of respondents was drawn from different price level of apartments. Specifically, 30 respondents were chosen from high cost apartment, 40 respondents from medium cost apartments, 50 respondents from low cost apartment and another 30 respondents from the commercial are in Bandar Sri Permaisuri. A convenient sampling of respondents from each apartment group was conducted. Although a systematic sampling is a better way of reducing bias, due to the difficulty of getting the chosen respondent to participate, a convenience sampling was instead adopted.

The questionnaire asked respondents about their assessment of various characteristics of physical development such as density, land use, walkway, open space and parking. The use of public transportation and pollution problems were also covered in the survey.

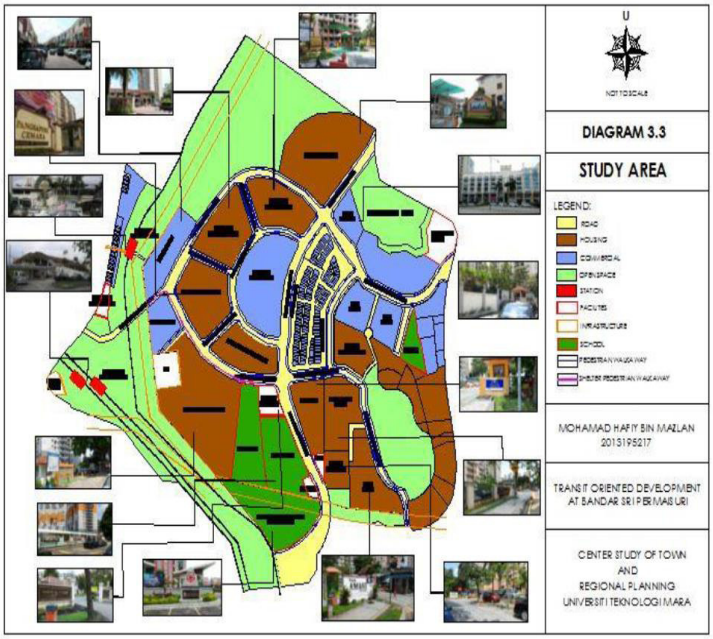

Fig.1. Land use in Bandar Sri Permaisuri
(Source: Kuala Lumpur City Hall, 2015)

5. Analysis

A physical descriptive analysis of the study area reveals that in terms of land use, Bandar Sri Permaisuri contains mixed land use, the highest being residential, followed by commercial and recreation/ institutional land use. This is due to the fact that the area was developed mainly to provide houses to the poor in Kuala Lumpur as well as to attract new people to move into the area. Figure 1 provides a snapshot of land use and main developments.

Table 1 provides summary of findings on land use analysis and its comparison with standards proposed by Calthorpe. It was found that Bandar Sri Permaisuri TOD has achieved the standards for residential and public area facilities categories and almost meet the core/employment category.

Table 1. Land use analysis at Bandar Sri Permaisuri TOD

Land Use	% of Study Area	% Calthorpe Neighborhood TOD Standard	Comments
Residential	59.1	50-80%	Meet the Standard
Core/Employment Commercial/Educationl	26.6%	30-70-%	Almost Meet the Standard
Public Area Facilities	14.3%	5-15%	Meet the Standard

Source: Authors' analysis based on Kuala Lumpur Cuty Hall data, 2015

For residential units, most of them are located in high rise apartments. Some high rises (Sri Penara) are low cost housing units, some such as Cemara are for medium cost while Bayu Tasik Condo 1 and 2 are considered high cost

apartments. Villa Laman Tasik is another high cost housing units with a townhouse concept. Table 2 below provides the complete details.

Table 2. Diversity of housing in Bandar Sri Permasiuri

6. Apartment Name	7. Number of Units	8. Cost Classification
9. Vista Amani Condomium	10. 560	11. High Cost
12. Kasturi Apartment	13. 320	14. Low Cost
15. Lestari Apartment	16. 540	17. Medium Cost
18. Mentari Condominium	19. 368	20. High Cost
21. Cendana Apartment	22. 672	23. Low Cost
24. Sri Penara Apartment	25. 2686	26. Low Cost
27. Cengal Condominium	28. 790	29. High Cost
30. Cemara Apartment	31. 1128	32. Medium Cost
33. Bayu Tasik Condimium 2	34. 580	35. High Cost
36. Batu Tasik Condominium 1	37. 828	38. High Cost
39. Villa Laman Tasik	40. 350	41. High Cost
42. Total	43. 8822	44.

Source: Interview with various apartment management

It is evident that Bandar Sri Permaisuri provides various levels of houses to cater for different needs of the population. Further calculation shows that the low cost housing at 3678 units represents 42 percent of all housing units in the township. Medium cost housing, on the other hand, represents 45 percent of all housing units, leaving only 13 percent of housing units as high cost housing. Thus, Bandar Sri Permasiuri has met Kuala Lumpur City Hall objectives of providing more than 30 percent of housing units as low cost and has benefitted Kuala Lumpur residents who are in need of low and medium cost houses.

In terms of population, assuming the current household size of 4.2 persons, the population of Bandar Sri Permaisuri is estimated at 370,254 people. This is a high density township. According to TOD Neighborhood Guideline, the minimum number of residents is 3000 to 5000 people with 600 to 1000 units of house or shops; thus, Bandar Sri Permaisuri has exceeded the required threshold.

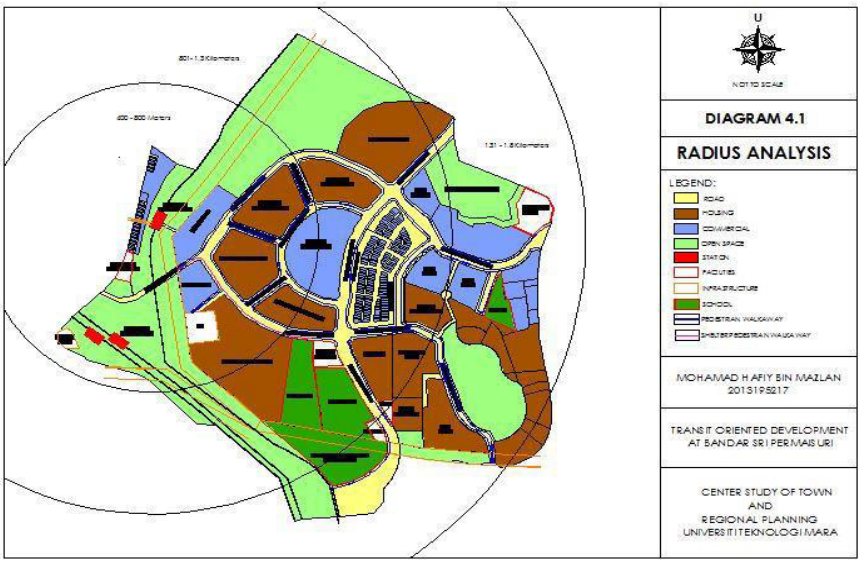

Fig.2. Radius analysis of development

In terms of radius analysis, it was found that majority of the housing units, especially the low cost apartments are within 800 meters from the Salak Selatan LRT stations. Thus, most units are within the recommended comfortable walking distance from the LRT station.

Table 3. Quality of life results

No.	Physical Development	Liket Scale											
		Strongly Dislike	%	Dislike	%	Not Sure	%	Like	%	Strongly Like	%	Total	%
a.	Mixed Development	1	7	14	9.3	10	6.7	104	69.3	21	14.0	150	100.0
b.	High Density Development Area	2	1.3	25	16.7	6	4.0	83	55.3	34	22.7	150	100.0
c.	Do you like to stay in house with high density	1	7	30	20.0	19	12.7	67	44.7	33	22.0	150	100.0
d.	Are you statisfied with the parking area given?	28	18.7	60	40.0	11	7.3	36	24.0	15	10.0	150	100.0
e.	Do you statified with the pedestrian walkaway that have been provided?	9	6.0	52	34.7	17	11.3	52	34.7	20	13.3	150	100.0
f.	Did you like to the public space that been provided at the												
	• Your housing area	1	7	17	11.3	11	7.3	105	70.0	16	10.7	150	100.0
	• Bandar Sri Permaisuri Area	11	7.3	19	12.7	6	4.0	104	69.3	10	6.7	150	100.0
g.	Pollution, Traffic Congestion, Cost Living at Bandar Sri Permaisuri												
	• Sound Pollution	21	14.0	113	75.3	16	10.7					150	100.0
	• Air Pollution	55	36.7	80	53.3	15	10.0					150	100.0
	• Social Problem	30	20.0	106	70.7	14	9.3					150	100.0
	• Traffic congestion	46	30.7	95	63.3	9	6.0					150	100.0
	• High Cost living	40	26.7	102	68.0	8	5.3					150	100.0
h.	Public Transportation	Opinion Scale											
		Strongly disagree	%	Disagree	%	Not sure	%	Agree	%	Strongly Agree	%	Total	%
	• Tren Station is to far away	1	7	3	2.0	9	6.0	107	71.3	30	20.0	150	100.0
	• No supported feeder bus to public transport station			3	2.0	22	14.7	54	36.0	71	47.3	150	100.0
	• /Public is like to use their own vehicles					13	8.7	84	56.0	53	35.3	150	100.0
	• Fare Public Transport is to Expensive			3	2.0	17	11.3	57	38.0	73	48.7	150	100.0

A survey of 150 respondents within the township had gauged their perception of quality of life in Bandar Sri Permaisuri TOD. Of total respondents, 66 percent were Malays, 34 percent were Chinese and 10 percent were Indians. In terms of occupations, 33 percent worked as professionals, 21 percent in the service industry and another 19 percent in clerical. As for household income 45 percent were in the bottom 40 percent of income group (less than RM2928), and another 43 percent were in the middle 40 percent income group (between RM2928 and RM6133).

It was also found that 83 percent of respondents used public transport for work and leisure which indicates that the TOD concept has achieved one of its main objectives of encouraging the residents to use public transport, especially the LRT.

In terms of analysis of Quality of Life and comfort within the TOD, a snapshot of the survey results is shown in Table 3. It was found that in the category of physical development, overwhelming majorities (73 percent) strongly liked or like to live in a mixed use development while 78 percent liked living in high density areas. They are also satisfied with the ample public space provided in the township. In terms of pedestrian walkway, about half were happy with its provision while another half are unhappy with it. This is perhaps due to the fact that the covered walkway is rather limited and covered less than half of the apartments in the area.

On the other hand, the respondents are not happy with limited parking space provided in the apartment areas since almost all apartments provide only one parking space per housing unit. The respondents are also unhappy with pollution, traffic congestion, social problems and high cost of living in Bandar Sri Permaisuri. Although majority of respondents used the LRT, they are unhappy about the distance to the station, the lack of feeder bus service and the rather expensive LRT fare.

5. Conclusion and recommendations

This paper has evaluated about the characteristics and quality of life of residents in Bandar Sri Permaisuri TOD. Generally, it was found that physically, the TOD has met the criteria of TOD characteristics especially related to mixed land use and high density development. The urban development in the township has the Salak Selatan LRT station as the focus point of transportation which is used by majority of respondents.

In terms of perception of Quality of Life, majority of respondents are happy with the mixed use, high density and public space provided in the township. However, they are unhappy with pollution, traffic congestions and social problem associated with living in a very high density development. The support services for the LRT such as feeder bus service and its rather distanced location from some apartments are also some of the respondents' grouses.

To improve the residents' quality of life in Bandar Sri Permaisuri, a few recommendations are offered. The first is to extend the covered walkway so that it would reach a few more apartments which are currently not provided with the facility. This would allow more people the convenience of going to the LRT station especially during rainy periods. Another recommendation is to provide feeder bus service that serves the apartment residents located farther away from the LRT station. This would increase ridership for the LRT. The third proposal is by providing additional parking space, preferable in multi-story parking which is proposed to at the new commercial development currently being constructed. Hopefully with these improvements, quality of life of residents in the neighborhood would improve considerably and helping TOD achieves its main objectives.

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